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INVESTIGATION OF THE PREPAREDNESS PROGRAM

INTERIM REPORT BY
PREPAREDNESS INVESTIGATING
SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

UNDER THE AUTHORITY OF

S. Res. 75

(88th Cong., 1st Sess.)

ON THE

MILITARY IMPLICATIONS OF THE PROPOSED
LIMITED NUCLEAR TEST BAN TREATY

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LETTER OF TRANSMITTAL

U.S. SENATE,
COMMITTEE ON ARMED SERVICES,
PREPAREDNESS INVESTIGATING SUBCOMMITTEE,
September 9, 1963.

Hon. RICHARD B. RUSSELL,
Chairman, Committee on Armed Services,
U.S. Senate.

MY DEAR MR. CHAIRMAN: There is transmitted herewith an interim report by the Preparedness Investigating Subcommittee, appointed under Senate Resolution 75 of the 88th Congress, on the military implications of the proposed limited nuclear test ban treaty.

The interim report deals specifically with the military and technical advantages and disadvantages which flow or might flow from the agreement. The subcommittee reached its conclusions after hearing 24 witnesses over a period of 11 months. Among our witnesses were many of the most informed and knowledgeable people in the Nation upon the military and technical aspects of the proposed treaty.

The subcommittee report is signed by myself, as chairman, and by Senators Stuart Symington, Henry M. Jackson, Strom Thurmond, Margaret Chase Smith, and Barry Goldwater. Senator Symington, however, has filed additional views which are also transmitted herewith.

Senator Leverett Saltonstall has declined to sign the report, and his dissenting view is likewise transmitted herewith.

Respectfully,

JOHN STENNIS,
Chairman, Preparedness Investigating Subcommittee.

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INTERIM REPORT ON THE MILITARY IMPLICATIONS OF THE PROPOSED LIMITED NUCLEAR TEST BAN TREATY

I. Introductory Statement

Since September 1962, the Preparedness Investigating Subcommittee has engaged in a comprehensive and extensive inquiry into the military and technical implications and aspects of the various nuclear test ban proposals.

Although the inquiry was originally directed to the entire field of nuclear test ban proposals from the standpoint of their potential impact upon our military posture and preparedness, the negotiation and signing of the three-environmental nuclear test ban agreement in Moscow caused the subcommittee to focus attention on the potential impact of that treaty upon the future of our Military Establishment and strategic forces.

This interim report is directed specifically to the partial test ban agreement. It deals with the military advantages and disadvantages to the United States which flow or might flow from the agreement. Political considerations, and matters involving foreign and international affairs, as such, are not within the scope of this report.

In considering the impact and effect of the proposed test ban it is important to remember that for nearly two decades this Nation has been confronted by an adversary who has openly and repeatedly proclaimed that his dominant goal is to destroy the nations of the non-Communist world. Only because we have maintained clear military superiority and the ability to inflict unacceptable damage upon him has the would-be aggressor been deterred. The basis of our deterrence is military superiority which, in turn, is based on our nuclear weapons programs and nuclear retaliatory forces.

It is vital to our survival that no step be taken which in any manner would impair the integrity and credibility of our deterrence or degrade the ability of our military forces to protect our security if we should be challenged militarily by a hostle nuclear power.

II. Background and Scope of Report

The chairman of the subcommittee, in opening the hearings on September 17, 1962, stated:

> The Senate Committee on Armed Services has legislative responsibility for the common defense generally and for matters affecting the size, composition, and equipage of the Armed Forces. It has a direct and legitimate interest in any and all activities which affect or may affect the development and procurement of weapons and the size and quality of our fighting forces.

He also said:

> Since weapons development and testing go hand in hand, we will inquire into the status of our nuclear test activities with respect both to weapons developments and weapons effects. Technical data now available on this question will be considered as well as information relating to our position in this field as compared with the progress of the Soviets.

In the months that have followed the subcommittee has made an exhaustive effort, on a scope and scale which is believed to be unprecedented as far as the Congress is concerned, to obtain complete and full information about the relationship of nuclear testing—in all environments—to the integrity of our deterrent forces and the ability of our retaliatory or second-strike forces to survive and respond to a nuclear attack. During the hearings thus far 2,800 pages of testimony were received from the 24 witnesses who are listed in alphabetical order in appendix A. Most of this testimony involved highly technical discussions relating to the needs and capabilities of our present and future nuclear weapon systems.

The overall objective of the subcommittee in this inquiry has been to develop as impartially, as objectively, and as fully as possible all available military and technical information bearing upon the subject matter so as to insure that the Senate would have available to it essentially the same body of military and technical evidence as is available to the executive branch of the Government in its formulation of nuclear test ban policies and in its weighing of their security implications. This objective has, we believe, been attained. The military, technical, and security problems associated with suspensions of nuclear testing have been identified, explored, and assessed. These problems will be discussed in this report with particular emphasis upon their relation to the treaty banning nuclear tests in the atmosphere, outer space, and underwater.

III. Summary of Major Findings

1. From the evidence we are compelled to conclude that serious—perhaps even formidable—military and technical disadvantages to the United States will flow from the ratification of the treaty. At the very least it will prevent the United States from providing our military forces with the highest quality of weapons of which our science and technology is capable.

2. Any military and technical advantages which we will derive from the treaty do not, in our judgment, counterbalance or outweigh the military and technical disadvantages. The Soviets will not be similarly inhibited in those areas of nuclear weaponry where we now deem them to be inferior.

3. Admittedly, however, other important factors—such as foreign policy, international affairs, and relations with other countries—are relevant in an overall assessment of the treaty. These are not within the scope of this report. When they are considered, as they must be, each individual must reach his own judgment about the wisdom and desirability of the treaty on the basis of personal philosophy, past experience, current knowledge, and relative weight which he assigns to the various factors involved.

IV. Comparison of U.S.–U.S.S.R. Nuclear Weapons Programs

In this section we will endeavor from the testimony we have received to compare the nuclear warhead knowledge and state of the art of the United States with that of the Soviet Union. This includes, of course, the important field of nuclear weapons effects.

The criteria we will use are the number of tests conducted within important yield ranges and the yield-to-weight ratio (the explosive energy released per pound of bomb) achieved in the test programs. We will compare the situation prevailing in 1958 prior to the moratorium and that prevailing today.

A. MULTIMEGATON WEAPONS CAPABILITIES

In 1958, at the onset of the 34-month nuclear test moratorium, the United States had conducted slightly more tests above 1 megaton in yield than had the Soviet Union. Of these U.S. tests, one-fifth were in yield ranges above 10 megatons. No tests had been conducted by the Soviet Union in this high yield category. As a result of this experimental program, the United States held a clear superiority over the Soviet Union in the yield it could achieve in a given thermonuclear weapon throughout the range of deliverable weights.

Following the abrogation of the moratorium by the Soviet Union, the test and performance records altered drastically. In 1961 and 1962 the Soviet Union conducted in yields above 10 megatons twice the number of tests which had been conducted by the United States in that yield range throughout the history of its nuclear test program. The total number of Soviet tests above 1 megaton was approximately four times that conducted by the United States in the same period (1961–62). In terms of yield-to-weight ratios, the Soviet Union, as a result of its aggressive test program and its concentration on very large yield weapons, has demonstrated clearly superior performance in all yield classes above approximately 15 megatons where the United States has had no testing experience since 1954. It is also worth noting that the scientific witnesses were unanimous in expressing uncertainty about the particular designs employed by the Soviets, to achieve the results observed in their very high yield experiments.

B. LOW-MEGATON AND SUBMEGATON WEAPON CAPABILITIES

Below a few thousand pounds in weight and a few megatons in yield the evidence available to us indicates that the United States continues to hold a lead in weapon design and performance.

For a variety of reasons the United States has chosen to concentrate its development efforts on weapons yielding from a few megatons down to fractions of kilotons. Conseqently, it probably continues to hold some advantage in design techniques over the Soviet Union in these areas and in the ability to maximize the yield which can be achieved at a given weight and size or, alternatively, to package a given yield in a device of minimum weight and size.

However, the rate of testing below 1 megaton indicates that the Soviet Union is attempting to challenge seriously the U.S. lead in the lower yield weapon categories. Prior to the 1958–61 moratorium the United States had conducted somewhat more than twice

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as many tests at yields below 1 megaton as had been detected in the Soviet Union. By the end of 1962 this ratio had dropped significantly. More important, the 1961–62 Soviet test series included more tests in this yield range than had been conducted in its entire program from 1949 through 1958. Even accounting for tests to assess the effects of explosions and tests to confirm the yield of stockpiled weapons, this constitutes impressive evidence that the Soviet Union has no intention of permitting U.S. superiority in weapon design and performance at yields below 1 megaton to go unchallenged. It is in this range of yields that the testing underground permitted by the treaty can be accomplished readily.

Furthermore, there is a serious question about the adequacy of our knowledge of the nuclear devices employed in the Soviet experiments in the lower yield range. Detection, indentification, and analytical capabilities are degraded at the lower end of this yield spectrum, particularly in the low and subkiloton area. Consequently, our confidence in any conclusions concerning the Soviet state of the art in weapons yielding up to a few kilotons is correspondingly low. While we believe that U.S. superiority extends to these very low yield ranges, hard evidence on this point does not exist and, accordingly, we accept the judgment of our Atomic Energy Commission witnesses that

> while some intelligence exists on which to base an estimate of U.S.S.R. tactical nuclear capability, the dearth of information [does] not permit a comprehensive U.S.–U.S.S.R. comparison. [For] future developments a credible U.S.S.R. development capability can be made by assuming a capability similar to ours.

C. WEAPONS EFFECTS PROGRAMS

Important as are programs associated with the acquisition of new or improved types of weapons, the advent of the missile age and the adoption of a second-strike or retaliatory strategic policy by the United States has elevated to a first priority tests to determine the effects of nuclear explosions on hardened missile sites and control centers, on reentry bodies in flight, and on radar, electronic, and communications systems. Of equal importance have become tests to determine what unique effects are produced by nuclear explosions in space, the atmosphere, and underwater so that the knowledge gained might be exploited for defensive purposes or our own weapon systems designed to resist them.

From the testimony before the subcommittee, it is clear that neither nation has conducted a weapons effects test program of sufficient size and complexity to resolve whatever doubts may exist about the adequacy of the design and the survivability of their nuclear weapon systems; nor has either tested sufficiently to fulfill the needs of their system designers and military planners.

However, the necessity and the motivation to conduct such experiments is clearly greater for the United States than for the Soviet Union. Since the early 1960's, the deterrent strategy of the United States has been based substantially on second-strike missile systems, that is, missile systems which can survive a massive first strike by a nuclear-armed enemy and still retain the ability to retaliate in such force as to destroy the attacker. By the mid-1970's this Nation's

nuclear deterrent will probably reside primarily in land- and sea-based missile systems designed to achieve that degree of survivability. To date, only Polaris has been subjected to a full-scale system test, including the explosion of the nuclear warhead. Minuteman, Atlas, and Titan have never been so tested, nor have models of the base complexes of the hardened underground Minuteman and Titan systems been subjected to close-in high yield nuclear explosions to prove the adequacy of their design. While all of the military witnesses expressed reasonable confidence in the ability of these systems to fulfill their missions, it is clear that some unresolved questions exist and that the absence of adequate design and vulnerability data has necessitated radical overdesign, redundancy, and excessive development and construction costs. Only by atmospheric testing can needed answers be obtained to the important unresolved questions.

However, there is one area of weapons effects knowledge in which the Soviet Union probably holds a distinct lead. By virtue of its large, multimegaton weapon tests, it is prudent to assume that the Soviet Union has acquired a unique and potentially valuable body of data on high yield blast, shock, communications blackout, and radiation and electromagnetic phenomena which is not available to the United States. Furthermore, due to the absence of comparable experiments, the United States is not now in a position to evaluate realistically the military effectiveness of the Soviet 50 to 100 megaton terror weapons.

In the field of weapons effects experiments related to the design and development of an effective antiballistic missile (ABM) system the evidence, although less conclusive, indicates that the Soviet Union in 1961 and 1962 conducted a series of complex high altitude operations which, if properly instrumented, could have provided substantial and important data on various types of radar blackout and nuclear effects. These Soviet experiments were clearly dictated by an ABM development program.

The United States has conducted no experiments comparable in complexity to those Soviet operations and a disturbing number of the U.S. high-altitude-effects experiments which were conducted were compromised either by considerations unrelated to the technical objectives of the test program, by inadequate or faulty instrumentation, or by operational inadequacies. Based on the testimony we have received, there can be little doubt but that the quantity and quality of information available to the United States on high altitude nuclear effects is inadequate for the Nation's military needs.

V. U.S. Needs for Nuclear Tests

In assessing the merits of the treaty which is now before the Senate for ratification, it is important to understand the kinds and objectives of certain nuclear test programs which, in the opinion of the subcommittee and based on testimony received by it, would be desirable or necessary in any future U.S. nuclear test programs.

The following chart summarizes the subcommittee's conclusions and distinguishes between selected test objectives which can be realized through underground test programs and those which could only be achieved through atmospheric testing.

Test objectives	Can be done under treaty
Survivability and responsiveness of hardened site missile launch complexes to high yield nuclear explosions.	No.
Response of hardened underground structures to blast and cratering from high yield surface burst nuclear weapons.	No.
Response of hardened underground structures to ground motion.	Yes.
Determination of missile warhead and nosecone vulnerability to nuclear explosions during atmospheric reentry.	No.
Reduction of missile warhead and nose cone vulnerabilities to nuclear explosions.	Yes.
Study of atmospheric and high altitude radar blackout phenomena.	No.
Study of communications blackout phenomena from high yield nuclear explosions.	No.
Full-scale operational tests of ABM systems	No.
Development of ABM warhead with maximum lethality and minimum blackout properties.	Partially.
Development of very high yield warheads, equal to or surpassing Soviet achievements.	No.
Determination of very high yield nuclear weapons effects.	No.
Determination of underwater nuclear weapon effects for improved antisubmarine warfare (ASW) systems.	No.
Development of weapons requiring less fissionable material than present designs.	Yes.
Development of pure fusion warheads	Yes.
Development of reduced fallout weapons	Yes.
Full-scale performance and reliability tests of Minuteman and Titan missile systems.	No.
Yield verification tests of stockpiled weapons up to approximately 1 megaton.	Yes.
Yield verification tests of stockpiled weapons above approximately 1 megaton.	No.
Troop and crew training tactical exercises using nuclear weapons.	No.

VI. Military Implications of Treaty

The primary objective of the hearings held by the subcommittee was to determine whether or not a suspension of, or limitation upon, nuclear testing would or could result in overall military and technical disadvantage for the United States. While the evidence leads us to the conclusion that the net result of the proposed treaty would be a military disadvantage, there was considerable divergence of opinion among the witnesses on the question of whether the disadvantage was acceptable from the standpoint of the Nation's security and whether the risks involved were acceptable on balance.

A. MILITARY DISADVANTAGES

The military disadvantages associated with the treaty which were discussed in testimony before the subcommittee were as follows:

1. *The United States probably will be unable to duplicate Soviet achievements in very high yield weapon technology.*—Though U.S. weapons laboratories are capable of developing and stockpiling designs yielding greater than 50 megatons without further experimentation, their weight and size would be incompatible with any existing or programed missile delivery vehicle. It is well within the capabilities of U.S. weapons laboratories to equal and to surpass the Soviet achievements, but to do so would require a number of atmospheric nuclear tests.

2. *The United States will be unable to acquire necessary data on the effects of very high yield atmospheric explosions.*—Without such knowledge it is unlikely that a realistic assessment can be made of the military value of such weapons, or that plans can be formulated to protect military weapons systems against their use. The data possessed by the United States on high yield weapons effects are inadequate to permit confident extrapolations to the higher yield categories.

3. *The United States will be unable to acquire data on high altitude nuclear weapons effects.*—Such data are important to the design of antiballistic missile system warheads and radars. Again, this is an area in which Soviet experiements may have provided them with greater knowledge than that now available to the United States. Throughout our hearings there was considerable dispute on this point. The treaty proponents accurately observed that the ABM warheads could be developed through underground testing and that development of acquisition and tracking radars was an electronics problem not directly dependent upon nuclear tests. It is clear, however, that the characteristics or specifications upon which such warhead design and development should be based are not sufficiently known and cannot be determined with confidence without additional high altitude effects tests. As the Atomic Energy Commission observed:

> While our knowledge of * * * blackout phenomena provides some limited guidance in the determination of [ABM] warhead criteria * * * an optimized design could only be chosen after continued atmospheric testing. Whether or not significant gains will result, can be argued.

And again:

> The minimal [warhead] specifications * * * can be met within the framework of existing technology. [But, assuming that a minimal warhead will not be acceptable,] testing both underground and in the atmosphere would be required to complete the development.

4. *The United States will be unable to determine with confidence the performance and reliability of any ABM system developed without benefit of atmospheric operational system tests.*—An ABM system will be required to function in the nuclear environment created both by its own defensive warhead explosions and those of the attacking enemy. Under such circumstances it is important to be as certain as possible that no element of the system possesses unknown vulnerabilities to

nuclear effects. All electronics components of the ground arrays and missiles must function; the missiles must be capable of operating in the presence of nuclear, thermal, and blast effects; the warheads must be resistant to nuclear radiations. It is apparent that unless a system of such complexity is tested in its operational environment, there will be a low level of confidence in its ability to perform the mission for which it was designed and produced. Many unknowns will arise in the course of the ABM development program which can only be explored and satisfied through the medium of atmospheric and high altitude nuclear testing.

5. *The United States will be unable to verify the ability of its hardened underground second-strike missile systems to survive close-in high-yield nuclear explosions.*—(See the discussion under the heading of "Weapons Effects Program" on pp. 4 to 5 of this report.)

6. *The United States will be unable to verify the ability of its missile reentry bodies under defensive nuclear attack to survive and to penetrate to the target without the opportunity to test nose cone and warhead designs in a nuclear environment under dynamic reentry conditions.*

7. *The treaty will provide the Soviet Union an opportunity to equal U.S. accomplishments in submegaton weapon technology.*—There can be no doubt that a treaty limiting testing to an underground environment will tend to favor experimentation at the lower end of the yield spectrum. Economic factors will play a part since costs rise significantly with relatively modest increases in yield for underground tests. There are also testing limitations arising from the type of strata, geological uncertainties, and engineering factors. Whether or not either the United States or the Soviet Union will choose to test underground at yields much greater than approximately 1 megaton is not known. In any case, it appears that the race for nuclear technological superiority will be confined to that area where the United States is believed to now hold a margin of superiority. The result, with time, will probably be the achievement of parity by the Soviet Union in this area without any equivalent opportunity for the United States to attain equality in very high yield weapon technology.

8. *The treaty will deny to the United States a valuable source of information on Soviet nuclear weapons capabilities.*—The results acquired from the analysis of radioactive debris generated by nuclear explosions has long been a basic source of intelligence on Soviet nuclear weapons programs. By driving Soviet testing underground, this intelligence will be denied the United States with the result that with the passage of time knowledge of the Soviet state of the art in weapons undergoing tests will be seriously degraded. The effect of the treaty will be to reinforce the difficulties already imposed on the United States by Soviet secrecy.

B. COUNTERARGUMENTS

A clear majority of the witnesses agreed that the treaty would result in military and technical disadvantages when compared with the increases in performance confidence and in the quality of weapon systems which would be derived from unlimited atmospheric testing.

It was stated, however, that it is characteristic of the experimental sciences that enough data is never available to satisfy the scientific search for knowledge. The testimony was unanimous that, except in the field of very high yield weapons, the United States today holds

a clear and commanding lead in nuclear weapon systems over any one or any combination of potential enemies.

This superiority was said to result from a larger and more diversified stockpile of nuclear weapons, by more numerous, varied, and sophisticated delivery systems, and by a greater capacity to produce nuclear materials, weapons, and delivery systems.

It was also asserted that a cessation of atmospheric nuclear testing would in no case prevent qualitative improvements being made in our weapons systems which would flow from a vigorous nonnuclear technology. Some witnesses noted that potential improvements in missile accuracy and reliability would continue to be exploited. Some noted that uncertainties in ABM radar performance when confronted with the various forms of blackout induced by nuclear explosions could be compensated by the deployment of greater numbers and wider dispersal of the radars.

Uncertainties concerning reentry vehicle warhead vulnerabilities could be reduced by a factor of 2 or 3, based on present knowledge an without further testing, by straightforward engineering improvements, it was said.

Some witnesses noted that so far as any uncertainties which might arise about the survivability of second-strike missile forces were concerned, these could be compensated by additional redundancy in missile systems, by greater numbers of missiles, and by greater dispersal. It was also noted that U.S. war plans tend to be conservative concerning the percentage of the second-strike force surviving a nuclear attack and in estimating the number of warheads capable of reaching enemy targets and so provide adequate margin for error.

In summary, it was the contention of witnesses who supported the treaty that it will tend to stabilize the advantages which the United States now maintains in military nuclear superiority over the Soviet Union. While recognizing that doubts concerning the quality of some of our weapons systems do exist, they maintained that these doubts can be compensated by "brute force" techniques by which quantity is substituted for quality at considerably greater cost to achieve approximately the same results in military system effectiveness.

It is interesting and sobering to note that, as we proclaim our nuclear superiority and our determination to maintain it, the Soviets do likewise. A dispatch from Moscow, dated August 30, 1963, quotes Red Star, the Soviet armed forces newspaper, as saying that Russia today possesses superiority in nuclear power "and has no intention of relinquishing it." Red Star also said that, while the United States intends to continue underground testing, the hopes of the Pentagon of attaining any "advantage in nuclear power by means of these explosions are illusory." And on September 3, 1963, Marshal Rodion Malinovsky, the Soviet Defense Minister, wrote in Komsomolskaya Pravda that the Soviet Union can "prove its complete military superiority over the United States."

VII. Proposed Safeguards

The Joint Chiefs of Staff in testimony before the subcommittee identified a number of military disadvantages which, in their collective judgment, would flow from the treaty. However, their assessment of the desirability of the treaty was not based on military considerations alone. Their conclusions on the matter also reflected their judgment

of the political and foreign policy advantages and disadvantages which would result from it. Their joint conclusion was that, on balance, the political and foreign policy advantages to be derived from the treaty outweighed the limitations which the treaty would impose on the Nation's weapon systems programs.

However, the Joint Chiefs qualified their support of the treaty by making their approval conditional on the effective implementation of four "safeguards" designed to reduce to a minimum the adverse effect the treaty would have on our weapon programs. On the basis of these "safeguards" Senator Jackson on August 14, 1963, offered a motion which was unanimously adopted by the subcommittee, and was subsequently approved by all members of the Senate Committee on Armed Services, requesting that the Joint Chiefs of Staff submit as soon as possible, and in any event prior to committee action on the treaty, a statement of the specific requirements to implement the "safeguards" proposed by the Joint Chiefs. Senator Jackson's motion, which sets forth the proposed safeguards in full, is attached as appendix B.

By a letter dated August 15, 1963, Senator Richard Russell, chairman of the Committee on Armed Services, transmitted the Jackson motion to the Secretary of Defense, and requested a statement in response to the motion.

Responses to the motion were received from the Joint Chiefs and the Office of the Secretary of Defense on August 24, 1963. These responses are attached as appendix C.

The subcommittee considers it to be vital that, if the treaty is ratified, the recommended "safeguards" be implemented fully and that detailed and specific programs to so implement them be presented by the executive branch.

The administration has expressed publicly its intent regarding the safeguards both in the responses to the motion by Senator Jackson and in other statements by the President, the Secretary of State, and the Secretary of Defense. Such statements are set forth in appendix D.

To permit the U.S. Senate to monitor the treaty safeguards it is necessary that the expressed good intentions be supplemented by definitive programs against which progress can be compared. At this time, we have not received details of testing, preparedness, and detection improvement programs which will permit the safeguards to be monitored in an effective manner. If the treaty is ratified it is the intention of the Preparedness Investigating Subcommittee to monitor the implementation of the safeguards and it would also be our hope that other committees of the Congress having jurisdiction in these areas would cooperate in this important program.

However, we wish to emphasize that even the most rigorous and conscientious implementation of the JCS safeguards will not alter, modify, or reduce the military and technical disadvantages listed herein which will result from this treaty. No safeguards can provide the benefits of testing where testing is not permitted, nor can they assure that this Nation will acquire the highest quality weapon systems of which it is capable when the means for achieving that objective are denied.

VIII. Detection and Identification

A brief word should be said about the problem of detection and identification in connection with the proposed treaty. "Detection" means a determination that an event has occurred without implying that it has been identified as a nuclear explosion. "Identification" means that an event is not only detected but that it is identified as a nuclear detonation.

During the previous negotiations on test ban treaties, the major controversy in this field has centered around the ability to detect, identify, and fix the location of underground explosions. The proposed three-environment treaty, by permitting underground testing, considerably reduces the problems involved in detection and identification but does not eliminate them entirely.

The capabilities of our verification system cannot be discussed in detail in an unclassified document. However, notwithstanding anticipated and programed improvements in the system, it will still possess both detection and identification "thresholds" below which clandestine testing is possible with a low probability of detection.

The yields at which clandestine tests may be conducted and probably escape detection will vary with altitude and geographical location, and some uncertainty exists in this field. There is also some controversy as to whether significant military advantages can be obtained by clandestine testing in the prohibited environments.

It is not the purpose of this section to explore these problems in detail. It our purpose here to point out that, under the limited treaty, problems of detection, identification, and verification still remain although they are of a lesser order of magnitude than would be true of a treaty banning underground testing.

IX. Concluding Statement

From the extensive evidence presented to us, we have come to the conclusion that the proposed treaty banning nuclear testing in the atmosphere, underwater, and in space will affect adversely the future quality of this Nation's arms, and that it will result in serious, and perhaps formidable, military and technical disadvantages. These disadvantages, in our judgment, are not outweighted or counterbalanced by the claimed military advantages. At the same time, we are not convinced that comparable military disadvantages will accrue to the nuclear weapon programs of the U.S.S.R.

Looking at the matter from the military aspect and from the effect of the treaty upon our military preparedness and posture, we cannot escape being impressed with the testimony of Gen. Thomas S. Power, commander in chief of the Strategic Air Command, and Gen. Bernard A. Schriever, commander of the Air Force Systems Command, who addressed themselves to the problem exclusively from the military point of view. General Power, after stating that he did not think the treaty "is in the best interests of the United States," said:

> I feel that we have military superiority now, and I feel very strongly that this has resulted in a world that has been free from nuclear warfare. I have a lower confidence factor

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> that we can and will maintain that military superiority under the test ban treaty * * *.

General Schriever told the subcommittee that there "are definite military disadvantages" to the treaty and that, as a military man, he felt he could protect the country better without the treaty than with it.

Of course, the endorsement of the treaty by Gen. Curtis E. LeMay, Chief of Staff of the Air Force, was considerably less than enthusiastic, and he testified that he probably would have recommended against the treaty had it still been in the proposal stage.

From the evidence we have learned that the Soviets have overtaken and surpassed us in the design of very high yield nuclear weapons; that they may possess knowledge of weapons effects and antiballistic missile programs superior to ours; and that under the terms of the treaty it is entirely possible that they will achieve parity with us in low yield weapon technology. These things are not grounds for complacency. We believe very strongly that Soviet secrecy and duplicity requires that this Nation possess a substantial margin of superiority in both the quality and the quantity of its implements of defense.

Although we have concluded that there will be a net military disadvantage to us if the treaty is ratified, we recognize the existence of other factors which, while not within the scope of this report, are pertinent to a final judgment on the treaty. Among these are matters related to international affairs, foreign policy, and relations with other countries. When these are taken into consideration the question becomes one of weighing relative risks, and our hearings provide ample evidence that the overall assessment of the relative merits and demerits of the treaty is a complex and difficult matter on which equally patriotic, informed, and dedicated persons may and do disagree. In the final analysis, then, each individual must reach his own judgment on the basis of personal philosophy, past experience, current knowledge, and the relative weight which he assigns to the various factors involved.

ADDITIONAL VIEWS OF SENATOR STUART SYMINGTON

Since 1955, when I was appointed a member of the Joint Subcommittee on Disarmament, I have followed closely the activity of our Government in arms control, disarmament, and nuclear test ban proposals; and specifically have studied carefully the three-environmental test ban treaty signed by our Government in Moscow on August 5, 1963.

To the best of my knowledge, the factual data contained in the report of the Preparedness Investigating Subcommittee is correct. But I believe the findings and conclusions are overly pessimistic as to the effect of the treaty on our national security.

As a member of both the Foreign Relations Committee and the Preparedness Investigating Subcommittee, I listened to and questioned many responsible witnesses—both in and out of Government. Most of these experts testified that our national security would be adequately protected under the terms of the treaty.

Much of this testimony was before the Foreign Relations Committee and, therefore, is not emphasized in this report.

Based on the record, I am worried about the treaty; but more worried about the possibility of an all-out nuclear exchange some day in the future—particularly if there is a proliferation of nuclear weapons among more countries. This treaty, a very small step, nevertheless could be the first step toward bringing nuclear weapons under some form of satisfactory control, which action should promote the possibilities of a just peace under law.

Therefore, I plan to vote for the treaty.

This does not deter me from signing the Preparedness Investigating Subcommittee report. The record made by the subcommittee is, to the best of my knowledge, the most complete record ever made on this vital subject by anybody on the military and technological implications of nuclear test ban treaties as they relate to our national security. It is a record which should be of inestimable future value to the Congress and the country.

STUART SYMINGTON.

DISSENTING VIEW OF SENATOR LEVERETT SALTONSTALL

As one Senator who attended the hearings conducted by both the Foreign Relations Committee and the Preparedness Investigating Subcommittee on the proposed nuclear test ban treaty, I find that I cannot, as a member of the Preparedness Subcommittee, concur with its report because I feel that its general tenor and its specific findings and conclusions are unduly pessimistic as to the effect of this treaty, if ratified, upon our national security. As a U.S. Senator, I intend to consent to the ratification of this nuclear test ban treaty.

I believe that the factual data contained in the report of the Preparedness Subcommittee is accurately stated. However, the nature of the conclusions drawn from this factual data are, in my opinion, overly adverse. It must be remembered that responsible Government officials such as the Secretary of Defense, the Joint Chiefs of Staff, leading scientists, and many others, some of whom appeared only before the Foreign Relations Committee, testified that our national security would be protected under the terms of the treaty even though some important atmospheric nuclear tests could no longer be conducted. This testimony is not sufficiently emphasized in the report, although I realize that some of it was not necessarily given in the hearings conducted by the Preparedness Subcommittee.

The Congress must insist upon an active, constructive, and energetic implementation of the four safeguards suggested by the Joint Chiefs of Staff so that our security will be maintained while the cause of peace and the lessening of tensions in the world are advanced.

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(*b*) Broad and forward-looking research programs should be carried on which will attract and retain able and imaginative personnel capable of insuring the highest practicable rate of progress that can be attained in all avenues of potential value to our offensive and defensive posture.

C. "The maintenance of the facilities and resources necessary to institute promptly nuclear tests in the atmosphere should they be deemed essential to our national security or should the treaty or any of its terms be abrogated by the Soviet Union."

1. *Criteria.*—

(*a*) The readiness-to-test program should be established on a governmentwide basis in support of a plan common to all participating agencies. The required resources and facilities should be maintained in a state of readiness, or earmarked, so that plans can be implemented within the reaction times established.

(*b*) Reaction times for resumption of testing in the prohibited environments must be established and maintained within the constraints of military requirements and reasonable costs. Reaction times will vary for the broad categories of testing. As an immediate objective, we should be able to conduct proof tests of weapons in stockpile in about 2 months; operational systems tests in about 2 to 3 months; weapon developments tests in about 3 months; and weapon effects tests in about 6 months.

(*c*) There must be provision for periodic updating of our test program plan and for checking our readiness to test.

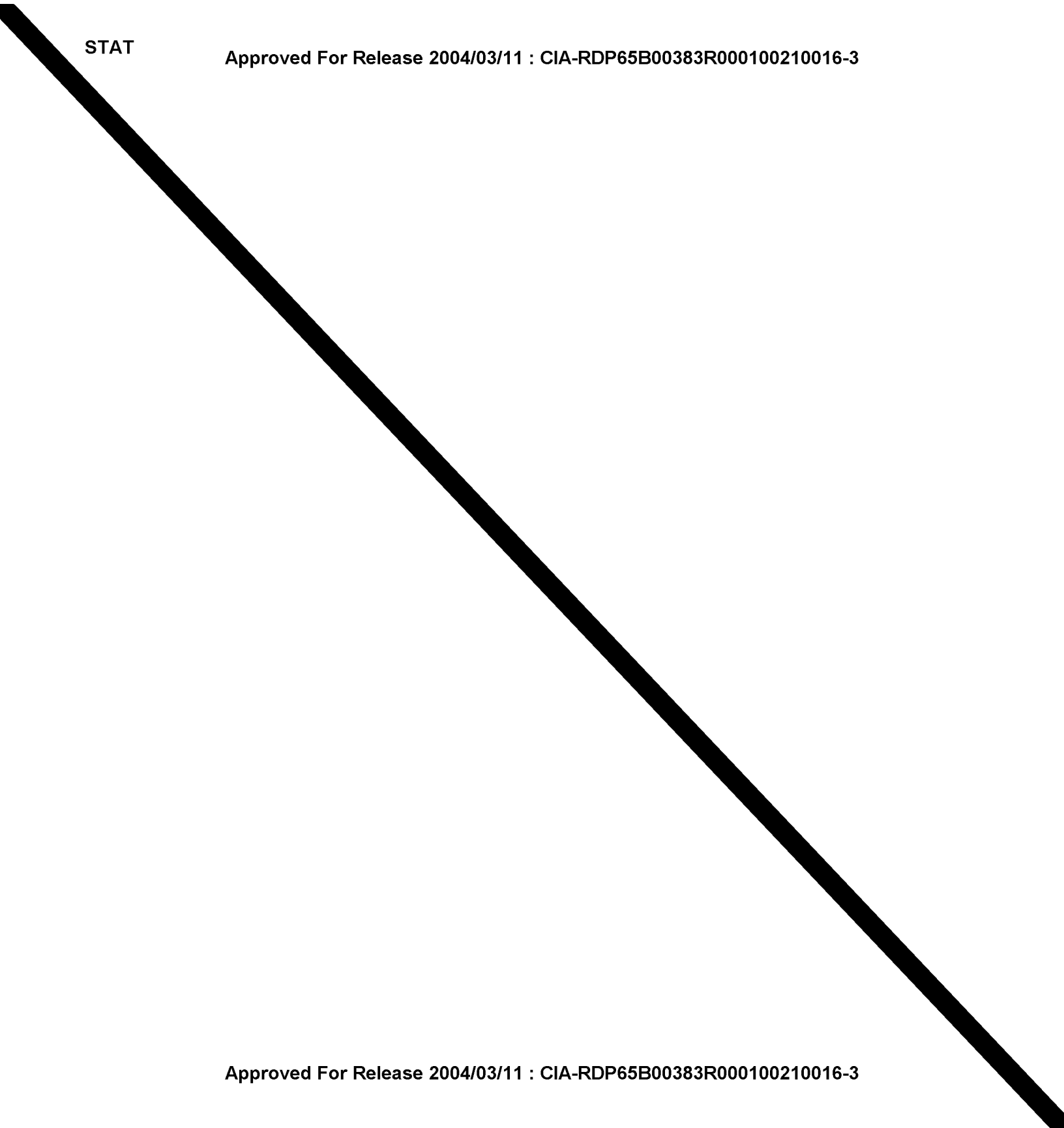
D. "The improvement of our capability, within feasible and practical limits, to monitor the terms of the treaty, to detect violations, and to maintain our knowledge of Sino-Soviet nuclear activity, capabilities, and achievements."

1. *Criteria.*—

(*a*) The current capability of the United States to detect and identify nuclear tests conducted by the Sino-Soviet bloc must be improved to the extent it is both feasible and remunerative. (Specific proposals for this purpose are currently under consideration.)

(*b*) A vigorous research and development program must be pursued in order to improve equipments and techniques for nuclear test detection and identification.

(*c*) Conventional intelligence sources must continue to complement the scientific intelligence techniques.



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